



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09 944,511	08 31 2001	David A. Lomas	106287	2645

23490 7590 08/29/2003

JOHN G TOLOMEI, PATENT DEPARTMENT
UOP LLC
25 EAST ALGONQUIN ROAD
P O BOX 5017
DES PLAINES, IL 60017-5017

EXAMINER

ARNOLD JR, JAMES

ART UNIT	PAPER NUMBER
----------	--------------

1764

DATE MAILED: 08/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/944,511

Applicant(s)

LOMAS, DAVID A.

Examiner

James Arnold, Jr.

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2001 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Interview Summary (PTO-413) (Paper No.) _____
- 4) ☐ Interview Summary (PTO-413) (Paper No.) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)

Art Unit: 1764

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gladrow et al. (USPN 3,915,840) in view of Rainis (USPN 5,328,595).

The Gladrow reference discloses a process for converting a hydrocarbon feed stream comprising passing a reformulation feed stream including saturated and olefinic hydrocarbons with carbon numbers of 5-8 to a reformulating reactor containing catalyst particles having a composition, and reformulating said reformulation feed stream in said reformulating reactor to produce a reformulated product stream and recovering said reformulated product stream. See column 3, lines 29-67; column 4, lines 29-54. The reference discloses a process wherein said catalyst particles in a cracking reactor to produce a cracked product, said catalyst particles in said

Art Unit: 1764

cracking reactor having a same composition as the catalyst particles in said reformulating reactor. See Column 4, lines 56-67. The reference discloses converting a hydrocarbon feed stream comprising contacting said hydrocarbon feed stream with catalyst particles having a composition in a first reactor to produce a cracked product; recovering a naphtha stream from said cracked product stream, said naphtha stream having an initial boiling point below 127 C (260 F); and contacting said naphtha stream with catalyst particles having said composition in a second reactor to produce an upgraded product stream. See Column 4, lines 57-68 and Column 5, lines 1-28. The reference discloses a process for converting a hydrocarbon feed stream comprising contacting said hydrocarbon feed stream with catalyst particles having a composition in a first reactor to produce a cracked product; separating said cracked product from said catalyst particles in a vessel to obtain a cracked product stream; and recovering an oil stream from said cracked product stream having an initial boiling point above about 200 C (392 F). See Figure 1 and column 4, lines 56-68.

The Gladrow reference does not disclose a process whereby reformulation proceeds at conditions that promote at least a 5% net yield increase in aromatics on a fresh reformulation feed basis indicating the occurrence of hydrogen transfer reactions. The reference does not disclose a process whereby there is further isolation of said reformulated product from said cracked product stream. The reference does not disclose a process whereby catalyst particles that had previously resided in said cracking reactor are cycled into said reformulating reactor. The reference does not disclose a process wherein a greater proportion of hydrocarbons with

Art Unit: 1764

isoparaffins in the reformulating reactor. The reference does not disclose a process wherein the concentration of sulfur compounds in the reformulated product stream is less than its concentration in the reformulation feed stream. The reference does not disclose a process wherein the concentration of nitrogen compounds in the reformulated product stream is less than its concentration in the reformulation feed stream. The reference does not disclose a process wherein the reformulation feed stream has an initial boiling point below about 200 C (392 F). The reference does not disclose a process wherein the upgraded product stream is recovered and isolated from said cracked product stream. The reference does not disclose a process wherein hydrogen transfer reaction predominates over cracked reaction in the second reactor. The reference does not disclose a process wherein olefins convert to aromatics in the second reactor. The reference does not disclose a process wherein the concentration of sulfur compounds in the upgraded product stream is 50% less than its concentration in the naphtha stream. The reference does not disclose a process wherein said naphtha stream has an end point below 230 C (446 F). The reference does not disclose contacting said oil stream with catalyst particles in a second reactor to produce an upgraded product stream; and recovering said upgraded product stream and isolating said upgraded product stream from said cracked product stream. The reference does not disclose the use of a crystalline alumina silicate or zeolite in a reformulation reaction.

The Rainis reference discloses the use of natural and synthetic zeolite catalysts for reformulation. See Column 1, lines 9-28.

It would have been obvious to one having ordinary skill in the art at the time the

Art Unit: 1764

indicating the occurrence of hydrogen transfer reactions because the reference discloses that hydrogen transfer reactions occur and the increase in aromatics indicate an increase in octane number. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process whereby there is further isolation of said reformulated product from said cracked product stream because the reformulated product stream offers increased octane value. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process whereby catalyst particles that had previously resided in said cracking reactor are cycled into said reformulating reactor because some of the catalyst particles will still be viable after utilization in the cracking reactor and will be effective for the reformulation reactor. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process whereby a greater proportion of hydrocarbons with carbon numbers of 5-8 undergo hydrogen transfer reaction than cracking reaction because hydrogen transfer reactions are effective for reformulation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process whereby olefins in said reformulation feed stream convert to isoparaffins in the reformulating reactor because isoparaffins are more easily utilized in the reformulation reactor. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process whereby the concentration of sulfur compounds in the reformulated product stream is less than its concentration in the reformulation feed stream; the concentration of sulfur compounds in the upgraded product stream is 50% less than its concentration in the

Art Unit: 1764

denitrogenation are typical results of cracking and reformulation reactions. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process whereby the reformulation feed stream has an initial boiling point below about 200 C (392 F) and a process wherein said naphtha stream has an end point below 230 C (446 F) because the reference discloses the use of the reformulation feed stream and the naphtha feed stream and it would be appropriate to use whatever type cut that would be effective for the upgrading process. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process whereby the upgraded product stream is recovered and isolated from said cracked product stream; wherein hydrogen transfer reaction predominate over cracked reaction in the second reactor; and wherein olefins convert to aromatics in the second reactor because the upgraded product stream represents an increase in aromatics and octane value and the hydrogen transfer reactions are essential to reformulation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process whereby said oil stream is contacted with catalyst particles in a second reactor to produce an upgraded product stream; and said upgraded product stream is recovered and isolated from said cracked product stream because the upgraded product stream has increased aromatics and octane value. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Gladrow to utilize the reformulation catalysts of Rainis because zeolitic crystalline aluminosilicates are known as effective reformulation catalysts and they would be effective for increasing octane number and aromatics.

Response to Arguments

Applicant's arguments have been fully considered but are deemed unpersuasive. Applicant's essential argument is that all of the limitations of claim 1, claim 10, and claim 17 are not cited within the Gladrow reference. All limitations, however, have been either cited in the Gladrow or Rainis references or proper reasons and motivation for indicating obviousness of any missing limitations have been cited. Also, the applicant states that the catalyst used for reformulation is not cited by the Gladrow reference. The catalyst, however, is disclosed by the newly cited Rainis reference. See Column 1, lines 9-28. Therefore, the Examiner maintains that Applicant's invention as claimed would have been obvious to one having ordinary skill in the art at the time the invention was made.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

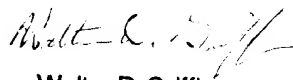
Art Unit: 1764

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Arnold, Jr. whose telephone number is 703-305-5308. The examiner can normally be reached on Monday-Thursday 8:30 AM-6:00 PM; Fridays from 8:30 AM-5:00 PM with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.

ja
August 22, 2003


Walter D. Griffin
Primary Examiner